

## GLOSSARY

### Recommissioning

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***air side systems***

Equipment used to heat, cool, and transport air within building HVAC systems.

***ASHRAE***

American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.

***balancing***

Process of measuring and adjusting equipment to obtain desired flows. Applies to both air side and water side systems.

***boiler***

Pressure vessel designed to transfer heat (produced by combustion) or electric resistance to a fluid. In most boilers, the fluid is water in the form of liquid or steam.

***British thermal unit (Btu)***

A unit of energy equivalent to the amount of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit.

***Btu***

See *British thermal unit*.

***calibration***

Process of adjusting equipment to ensure that operation is within design parameters.

***carbon monoxide***

Colorless, odorless, poisonous gas formed during incomplete combustion of fuel.

***central plant***

Centrally located equipment that satisfies a building's cooling and heating loads.

***CFCs***

See *chlorofluorocarbons*.

***cfm***

Cubic feet per minute.

***chiller***

Mechanical device that generates cold liquid, which is circulated through cooling coils to cool the air supplied to a building.

***chlorofluorocarbons***

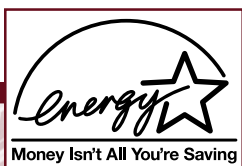
Chemical compounds consisting of carbon, hydrogen, chlorine, and fluorine, once used widely as aerosol propellants and refrigerants. Believed to deplete the atmospheric ozone layer.

***coil, condenser***

A heat exchanger used to condense refrigerant from a gas to a liquid.

***coil, cooling***

Heat exchanger used to cool air under forced convection with or without dehumidification. May consist of a single coil section or several coil sections assembled into a bank.

***coil, fan***

A device that combines a heat exchanger and a fan in a single unit that conditions air by forced convection.

***coil, heating***

Heat exchanger that heats air under forced convection. May consist of a single coil section or several coil sections assembled into a bank.

***combustion air***

Air that supplies the oxygen required to burn fuel.

***commissioning***

The quality assurance process that ensures design intent is met for new facilities or major rehabilitation.

***condenser***

Heat exchanger in a refrigeration system that expels building heat absorbed in the evaporator.

***conditioned air***

Air that serves a space and that has had its temperature and/or humidity altered to meet design specifications.

***controls***

An instrument or set of instructions for operating or regulating building systems.

***control, pneumatic***

A control that utilizes air pressure to vary equipment operation.

***control, set back***

The practice of reducing the thermostat setpoint during unoccupied times.

***cooling tower***

Device that dissipates heat from water-cooled systems through a combination of heat and mass transfer, whereby the water to be cooled is distributed in the tower and exposed to circulated ambient air.

***cycling***

The noncontinuous operation of equipment.

***dampers***

Single- or multiple-blade devices, either manually or automatically opened or closed, that control the flow of air.

***demand charges***

Fees levied by a utility company for electric demand.

***demand, electric***

Electrical power delivered to a system at a given time or averaged over a designated period. Expressed in kilowatts.

***diffuser, HVAC***

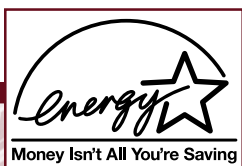
A device that distributes conditioned air to a space.

***diffuser, lighting***

A device that distributes light produced by lamps into a space.

***efficiency***

Ratio of power output to input.

**EMS**

See *energy management system*.

**energy management system (EMS)**

The control system that monitors the environment and energy usage in a building and alters equipment operation to conserve energy while providing occupant comfort.

**envelope, building**

The outer shell of a building, including walls, roof, windows, and doors.

**evaporator**

Heat exchanger in a refrigeration system that absorbs heat from chilled water or building air, thus reducing the supply temperature.

**fouling**

The buildup of a film that reduces heat transfer.

**heat exchanger**

A device that transfers heat from one fluid to another.

**humidistat**

A device that responds to humidity changes and controls equipment by seeking a setpoint.

**HVAC**

Heating, ventilating, and air-conditioning.

**kilowatt (kW)**

Unit of power equal to 1,000 watts.

**kilowatt-hour (kWh)**

Unit of electric consumption equal to the work done by 1 kilowatt acting for 1 hour.

**kW**

See *kilowatt*.

**kWh**

See *kilowatt-hour*.

**load**

The demand upon the operating resources of a system. In the case of energy loads in buildings, the word generally refers to heating, cooling, and electrical (or demand) loads.

**maintenance**

An ongoing process to ensure equipment operates at peak performance.

**occupancy sensor**

A device that detects heat (passive infrared) or a shift in the frequency of reflected ultrasonic sound waves, to control operation of lights or equipment accordingly.

**off-peak**

Refers to a utility rate schedule that designates the time of day when energy and demand costs are typically less expensive.

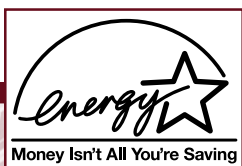
**on-peak**

Refers to a utility rate schedule that designates the time of day when energy and demand costs are typically more expensive.

**packaged unit**

A self-contained HVAC unit that provides heating and/or cooling to a building space.



**part-load**

Condition when equipment operates at less than full capacity to meet the demand placed upon it.

**part-load performance**

Equipment efficiency at less than full capacity.

**pressure drop**

The loss in pressure experienced by flowing water or air due to friction and obstructions.

**radiator**

Device that provides warmth to a space through radiant or convective heat provided by either steam or hot water.

**recommissioning**

Recommissioning ensures system functionality. It is an inclusive and systematic process intended not only to optimize how equipment and systems operate, but also to optimize how the *systems function together*.

**refrigerant**

Substance, such as *CFCs*, *HCFCs*, *HFCs*, air, ammonia, water, or carbon dioxide, used to provide cooling by evaporation and condensation.

**reset, chilled water**

The practice of increasing chilled water temperature to obtain higher chiller efficiency.

**reset, condenser water**

The practice of decreasing condenser water temperature to obtain higher chiller efficiency.

**rooftop unit**

Air-handling equipment such as *packaged units* located on the roof.

**scaling**

See *fouling*.

**schedule**

A control sequence that turns equipment on and off.

**setpoint**

Desired temperature, humidity, or pressure in a space, duct, etc.

**shell, building**

See *envelope, building*.

**space**

The distinct area to which conditioned air is delivered.

**steam trap**

A device that separates air and condensed water from steam.

**TAB**

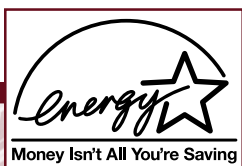
See *testing, adjusting, and balancing*.

**testing, adjusting, and balancing (TAB)**

The process of adjusting HVAC system components to supply air and water flows at design or revised specifications.

**thermostat**

A device that responds to temperature changes and controls equipment by seeking a setpoint accordingly.

**ton**

Unit of cooling capacity equal to 12,000 Btu/hr.

**tubes, condenser**

Heat exchanger tubes through which condenser water is pumped to allow heat transfer between the condenser water and the refrigerant.

**tubes, evaporator**

Heat exchanger tubes through which chilled water is pumped to allow heat transfer between the chilled water and the refrigerant.

**tune-up, building**

The purposeful sequence of maintenance and operational improvements, undertaken at a specific point in time, designed to reduce energy use, heating loads, and cooling loads of existing facilities.

**variable air volume (VAV)**

A type of air-handling system that provides air at a constant temperature and varies the air quantity to each zone to match the variation in room load.

**VAV**

See *variable air volume*.

**water side systems**

Equipment used to heat, cool, and transport water to building HVAC systems.

## Lighting

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**ballast**

Power-regulating device that modifies input voltage and controls current to provide the electrical conditions necessary to start and operate gaseous discharge lamps.

**carbon dioxide**

Colorless, odorless, incombustible gas formed during respiration, combustion, and organic decomposition. Increasing amounts of carbon dioxide in the atmosphere are believed to contribute to the global warming phenomenon.

**CERCLA**

Comprehensive Environmental Response, Compensation and Liability Act (1980) an EPA regulation. Also known as the Superfund law.

**color rendering index (CRI)**

A measure ranging from 0 to 100 of the accuracy with which a light source renders different colors in comparison to natural light, which has a measure of 100.

**controls**

An instrument or set of instructions for operating or regulating building systems.

**CRI**

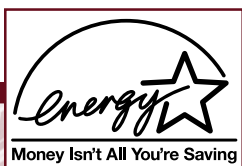
See *color rendering index*.

**cycling**

The noncontinuous operation of equipment.

**deadband**

A setting in the lighting control that provides a time delay, signaling the lights to switch off only if the light level is somewhat *above* the setting, or on only if the level is somewhat *below* the setting.

**DEHP**

Di (2-ethylhexyl) phthalate, an insulator used to replace PCBs in ballast capacitors starting in 1979. DEHP is listed as a hazardous waste in its pure form, but, according to *RCRA*, it is no longer considered hazardous once used in a lighting ballast.

**demand charges**

Fees levied by a utility company for electric demand.

**demand, electric**

Electrical power delivered to a system at a given time or averaged over a designated period. Expressed in kilowatts.

**diffuser, HVAC**

A device that distributes conditioned air to a space.

**diffuser, lighting**

A device that distributes light produced by lamps into a space.

**efficacy**

The ratio of lamp lumen output to total lamp power input expressed in lumens per watt.

**efficiency**

Ratio of power output to power input.

**EMS**

See *energy management system*.

**energy management system (EMS)**

The control system that monitors the environment and energy usage in a building and alters equipment operation to conserve energy while providing occupant comfort.

**footcandle (fc)**

Unit of illuminance equal to 1 lumen per square foot.

**heat gain**

The rate at which heat enters or is generated within a space at a given instant.

**HID**

High-intensity discharge.

**HVAC**

Heating, ventilating, and air-conditioning.

**IAQ**

Indoor air quality.

**IES**

Illuminating Engineering Society.

**illuminance**

Commonly called light level, the light intensity arriving on a surface measured in footcandles.

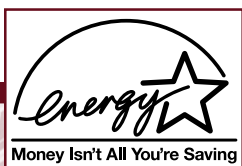
**internal rate of return (IRR)**

Compound interest rate at which the total discounted benefits equal total discounted costs for a particular investment.

**IRR**

See *internal rate of return*.



**kilowatt (kW)**

Unit of power equal to 1,000 watts.

**kilowatt-hour (kWh)**

Unit of electric consumption equal to the work done by 1 kilowatt acting for 1 hour.

**kW**

See *kilowatt*.

**kWh**

See *kilowatt-hour*.

**load**

The demand upon the operating resources of a system. In the case of energy loads in buildings, the word generally refers to heating, cooling, and electrical (or demand) loads.

**lumen**

Unit measurement of the rate at which a light source produces light per unit time.

**luminaire**

Complete lighting unit, consisting of one or more lamps together with a housing, the optical components to distribute the light from the lamps, and the electrical components (ballast, starters, etc.) necessary to operate the lamps.

**luminance**

Commonly referred to as brightness, the light leaving a surface measured in footlamberts. It considers both *illuminance* on the surface and reflectance of the surface.

**luminance ratio**

The ratio between the *luminances* of any two areas in the visual field. This is a measure of the uniformity of luminance.

**maintenance**

An ongoing process to ensure equipment operates at peak performance.

**nitrogen oxides**

Chemical compounds that contain nitrogen and oxygen. They react with volatile organic compounds in the presence of heat and sunlight to form ozone and are a major precursor to acid rain.

**occupancy sensor**

A device that detects heat (passive infrared) or a shift in the frequency of reflected ultrasonic sound waves, to control operation of lights or equipment accordingly.

**packaged unit**

A self-contained HVAC unit that provides heating and/or cooling to a building space.

**payback**

See *payback, simple*.

**payback, simple**

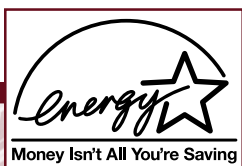
Also known as *payback*. Measurement of the elapsed time between an initial investment and the point at which accumulated savings are sufficient to offset the initial investment.

**PCB**

Polychlorinated biphenyl. A substance used as an insulator in the capacitor of fluorescent and HID magnetic ballasts prior to 1970. PCBs have been labeled as carcinogenic and can cause skin, liver, and reproductive disorders.

**photocell**

A device that responds electrically to the presence of light.



**power factor**

Ratio of real power to total apparent power.

**power quality**

The degree to which voltage and current wave forms conform to a sinusoidal shape and are in synchronous phase with one another. Poor power quality can have negative impacts on electrical equipment.

**RCRA**

Resource Conservation and Recovery Act, an EPA Regulation.

**reflector**

A device installed in *luminaires* used to direct light from a source via specular or diffuse reflection.

**rightsizing**

The process of correctly sizing equipment to the peak load.

**rooftop unit**

Air-handling equipment such as *packaged units* located on the roof.

**schedule**

A control sequence that turns equipment on and off.

**sulfur dioxide**

A heavy, colorless, pungent air pollutant formed primarily by the combustion of fossil fuels such as coal. It is a respiratory irritant and a precursor to the formation of acid rain.

**VCP**

See *visual comfort probability*.

**visual comfort probability (VCP)**

A rating given to lighting systems expressed as the percentage of people who will find light output acceptable in terms of glare due to direct light from luminaires.

**voltage, volts**

International system unit of electric potential or the amount of electrical flow, also referred to as electromotive force.

## Supplemental Load Reductions

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**AHU**

See *air-handling unit*.

**air-handling unit (AHU)**

Equipment used to distribute conditioned air to a space. Includes heating and cooling coils, fans, ducts, and filters.

**air side systems**

Equipment used to heat, cool, and transport air within building HVAC systems.

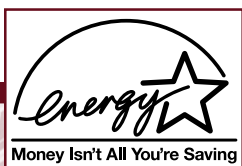
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**balancing**

Process of measuring and adjusting equipment to obtain desired flows. Applies to both air side and water side systems.



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Power-regulating device that modifies input voltage and controls current to provide the electrical conditions necessary to start and operate gaseous discharge lamps.

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Colorless, odorless, incombustible gas formed during respiration, combustion, and organic decomposition. Increasing amounts of carbon dioxide in the atmosphere are believed to contribute to the global warming phenomenon.

**CFCs**

See *chlorofluorocarbons*.

**cfm**

Cubic feet per minute.

**chiller**

Mechanical device that generates cold liquid, which is circulated through cooling coils to cool the air supplied to a building.

**chlorofluorocarbons**

Chemical compounds consisting of carbon, hydrogen, chlorine, and fluorine, once used widely as aerosol propellants and refrigerants. Believed to cause depletion of the atmospheric ozone layer.

**coil, condenser**

A heat exchanger used to condense refrigerant from a gas to a liquid.

**coil, cooling**

Heat exchanger used to cool air under forced convection, with or without dehumidification. May consist of a single coil section or several coil sections assembled into a bank.

**coil, fan**

A device that combines a heat exchanger and a fan in a single unit that conditions air by forced convection.

**coil, heating**

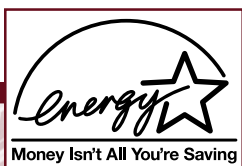
Heat exchanger that heats air under forced convection. May consist of a single coil section or several coil sections assembled into a bank.

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**demand charges**

Fees levied by a utility company for electric demand.

**demand, electric**

Electrical power delivered to a system at a given time or averaged over a designated period. Expressed in kilowatts.

**demand ventilation**

Method of controlling the amount of outdoor air intake based on carbon dioxide levels in a space.

**desiccant**

A material that absorbs moisture from its surrounding environment.

**domestic hot water**

All hot water consumed in a building that is used for purposes other than heating a space.

**efficacy**

The ratio of lamp lumen output to total lamp power input expressed in lumens per watt.

**efficiency**

Ratio of power output to power input.

**ENERGY STAR label**

EPA's trademark symbolizing excellence in energy efficiency.

**envelope, building**

The outer shell of a building, including walls, roof, windows, and doors.

**exhaust air**

Air removed from a building and not reused.

**glazing**

Glass set or made to be set in frames.

**glazing system**

A configuration of materials with a transparent or translucent element designed to admit sunlight.

**GPM**

Gallons per minute. A measure of water flow rate.

**heat exchanger**

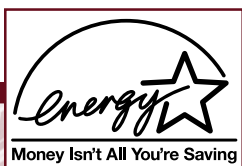
A device that transfers heat from one fluid to another.

**heat, latent**

The heat required to change the state of matter from a liquid to gas or gas to liquid.

**heat pump**

Heat pump utilize the vapor compression refrigeration cycle the same that a DX unit or chiller does. The difference is that a heat pump can reverse the direction of heat flow which naturally flows from warmer to cooler areas.

**heat, sensible**

The heat required to change temperature without changing state of matter. This temperature change can occur by exposure to radiation, friction between two objects, chemical reaction, or contact with a hotter object.

**hp**

Horsepower. A unit of mechanical power.

**HVAC**

Heating, ventilating, and air-conditioning.

**IAQ**

Indoor air quality.

**infiltration**

Air that leaks into a building through the building shell.

**kilowatt (kW)**

Unit of power equal to 1,000 watts.

**kilowatt-hour (kWh)**

Unit of electric consumption equal to the work done by 1 kilowatt acting for 1 hour.

**kW**

See *kilowatt*.

**kWh**

See *kilowatt-hour*.

**load**

The demand upon the operating resources of a system. In the case of energy loads in buildings, the word generally refers to heating, cooling, and electrical (or demand) loads.

**maintenance**

An ongoing process to ensure equipment operates at peak performance.

**nitrogen oxides**

Chemical compounds that contain nitrogen and oxygen. They react with volatile organic compounds in the presence of heat and sunlight to form ozone and are a major precursor to acid rain.

**occupancy sensor**

A device that detects heat (passive infrared) or a shift in the frequency of reflected ultrasonic sound waves, to control operation of lights or equipment accordingly.

**payback**

See *payback, simple*.

**payback, simple**

Also known as *payback*. Measurement of the elapsed time between an initial investment and the point at which accumulated savings are sufficient to offset the initial investment.

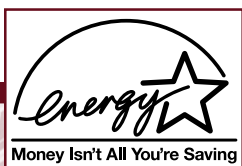
**PPM**

Parts per million. A unit of concentration.

**roof curb**

A raised and reinforced area on a roof for mounting equipment.



**setpoint**

Desired temperature, humidity, or pressure in a space, duct, etc.

**shell, building**

See *envelope, building*.

**space**

The distinct area to which conditioned air is delivered.

**timeclock**

The control device used to turn equipment on and off at set times of the day.

**ton**

Unit of cooling capacity equal to 12,000 Btu/hr.

**transformer**

A device that reduces the incoming line voltage, usually to a standard level, so that it may be used to operate electrical equipment in a building.

**tune-up, building**

The purposeful sequence of maintenance and operational improvements, undertaken at a specific point in time, designed to reduce energy use, heating loads, and cooling loads of existing facilities.

**W/sf**

Watts per square foot.

## Fans

---

**AHU**

See *air-handling unit*.

**air-handling unit (AHU)**

Equipment used to distribute conditioned air to a space. Includes heating and cooling coils, fans, ducts, and filters.

**air side systems**

Equipment used to heat, cool, and transport air within building HVAC systems.

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**balancing**

Process of measuring and adjusting equipment to obtain desired flows. Applies to both air side and water side systems.

**boiler**

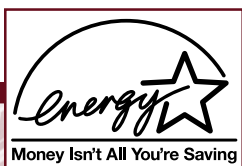
Pressure vessel designed to transfer heat produced by combustion or electric resistance to a fluid. In most boilers, the fluid is water in the form of liquid or steam.

**British thermal unit (Btu)**

A unit of energy equivalent to the amount of heat required to raise the temperature of 1 pound of water 1 degree Fahrenheit.

**Btu**

See *British thermal unit*.

**CAV**

See *constant volume*.

**CFCs**

See *chlorofluorocarbons*.

**cfm**

Cubic feet per minute.

**chiller**

Mechanical device that generates cold liquid, which is circulated through cooling coils to cool the air supplied to a building.

**chlorofluorocarbons**

Chemical compounds consisting of carbon, hydrogen, chlorine, and fluorine, once used widely as aerosol propellants and refrigerants. Believed to cause depletion of the atmospheric ozone layer.

**coefficient of performance (COP)**

A measure of efficiency in which a higher value designates a more efficient system.

**coil, condenser**

A heat exchanger used to condense refrigerant from a gas to a liquid.

**coil, cooling**

Heat exchanger used to cool air under forced convection, with or without dehumidification. May consist of a single coil section or several coil sections assembled into a bank.

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A device that combines a heat exchanger and a fan in a single unit that conditions air by forced convection.

**coil, heating**

Heat exchanger that heats air under forced convection. May consist of a single coil section or several coil sections assembled into a bank.

**condenser**

Heat exchanger used to expel building heat absorbed in the evaporator of a refrigeration system.

**conditioned air**

Air that serves a space that has had its temperature and/or humidity altered to meet design specifications.

**constant volume (CAV, constant air volume)**

Type of air-handling system that supplies the conditioned space at a constant air flow and modulate heating and cooling by varying the air temperature.

**controls**

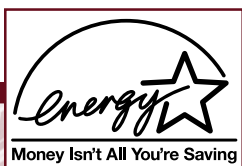
An instrument or set of instructions for operating or regulating building systems.

**cooling tower**

Device that dissipates heat from water-cooled systems through a combination of heat and mass transfer, whereby the water to be cooled is distributed in the tower and exposed to circulated ambient air.

**COP**

See *coefficient of performance*.

**cycling**

The noncontinuous operation of equipment.

**demand charges**

Fees levied by a utility company for electric demand.

**demand, electric**

Electrical power delivered to a system at a given time or averaged over a designated period. Expressed in kilowatts.

**downsizing**

Process of reducing the size (capacity) of equipment so that it operates efficiently at design load conditions.

**ductwork**

The distribution system for air in HVAC systems. It is usually made of sheet metal or fiberglass.

**efficiency**

Ratio of power output to power input.

**EMS**

See *energy management system*.

**energy management system (EMS)**

The control system that monitors the environment and energy usage in a building and alters equipment operation to conserve energy while providing occupant comfort.

**evaporator**

Heat exchanger in a refrigeration system that absorbs heat from chilled water or building air, thus reducing the supply temperature.

**fouling**

The buildup of a film that reduces heat transfer.

**gasket**

Material used to seal a joint against leakage.

**GPM**

Gallons per minute. A measure of water flow rate.

**heat exchanger**

A device that transfers heat from one fluid to another.

**heat, latent**

The heat required to change the state of matter from a liquid to gas or gas to liquid.

**heat pump**

Heat pump utilize the vapor compression refrigeration cycle the same that a DX unit or chiller does. The difference is that a heat pump can reverse the direction of heat flow which naturally flows from warmer to cooler areas.

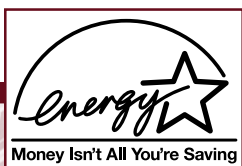
**heat, sensible**

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**hp**

Horsepower. A unit of mechanical power.



**HVAC**

Heating, ventilating, and air-conditioning.

**impeller**

The rotating element of a fan or pump used to circulate the air or water.

**internal rate of return (IRR)**

Compound interest rate at which the total discounted benefits become equal to total discounted costs for a particular investment.

**IRR**

See *internal rate of return*.

**kilowatt (kW)**

Unit of power equal to 1,000 watts.

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**load**

The demand upon the operating resources of a system. In the case of energy loads in buildings, the word generally refers to heating, cooling, and electrical (or demand) loads.

**maintenance**

An ongoing process to ensure equipment operates at peak performance.

**meter**

A device used to measure and display or record data.

**nitrogen oxides**

Chemical compounds that contain nitrogen and oxygen. They react with volatile organic compounds in the presence of heat and sunlight to form ozone and are a major precursor to acid rain.

**off-peak**

Refers to a utility rate schedule that designates the time of day when energy and demand costs are typically less expensive.

**on-peak**

Refers to a utility rate schedule that designates the time of day when energy and demand costs are typically more expensive.

**packaged unit**

A self-contained HVAC unit that provides heating and/or cooling to a building space.

**part-load**

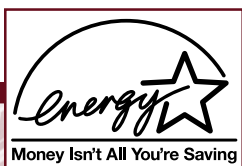
Condition when equipment operates at less than full capacity to meet the demand placed upon it.

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See *payback, simple*.

**payback, simple**

Also known as *payback*. Measurement of the elapsed time between an initial investment and the point at which accumulated savings are sufficient to offset the initial investment.



**power factor**

Ratio of real power to total apparent power.

**pressure drop**

The loss in pressure experienced by flowing water or air due to friction and obstructions.

**refrigerant**

Substance, such as *CFCs*, *HCFCs*, *HFCs*, air, ammonia, water, or carbon dioxide, used to provide cooling by evaporation and condensation.

**reset, chilled water**

The practice of increasing chilled water temperature to obtain higher chiller efficiency.

**reset, condenser water**

The practice of decreasing condenser water temperature to obtain higher chiller efficiency.

**rightsizing**

The process of correctly sizing equipment to operate efficiently at design load conditions.

**rooftop unit**

Air-handling equipment such as *packaged units* located on the roof.

**scaling**

See *fouling*.

**schedule**

A control sequence that turns equipment on and off.

**seasonal energy-efficiency ratio (SEER)**

Cooling capacity (Btu/hr) divided by total input power (watts) requirement where both are seasonal averages.

**SEER**

See *seasonal energy-efficiency ratio*.

**sheave**

(Pronounced shiv.) Pulley.

**space**

The distinct area to which conditioned air is delivered.

**thermostat**

A device that responds to temperature changes and controls equipment by seeking a setpoint accordingly.

**timeclock**

The control device used to turn equipment on and off at set times of the day.

**ton**

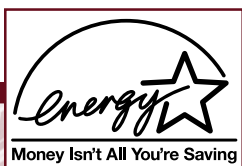
Unit of cooling capacity equal to 12,000 Btu/hr.

**tune-up, building**

The purposeful sequence of maintenance and operational improvements, undertaken at a specific point in time, designed to reduce energy use, heating loads, and cooling loads of existing facilities.

**variable air volume (VAV)**

A type of air-handling system that provides air at a constant temperature and varies the air quantity to each zone to match the variation in room load.

**VAV**

See *variable air volume*.

**VSD**

See *variable-speed drive*.

**variable-speed drive (VSD)**

A device used to adjust the speed of an AC motor to match load requirements.

## Heating and Cooling

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**AHU**

See *air-handling unit*.

**air-handling unit (AHU)**

Equipment used to distribute conditioned air to a space. Includes heating and cooling coils, fans, ducts, and filters.

**air side systems**

Equipment used to heat, cool, and transport air within building HVAC systems.

**ARI**

Air-Conditioning and Refrigeration Institute.

**ASHRAE**

American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc.

**ASME**

American Society of Mechanical Engineers.

**boiler**

Pressure vessel designed to transfer heat produced by combustion or electric resistance to a fluid. In most boilers, the fluid is usually water in the form of liquid or steam.

**calibration**

Process of adjusting equipment to ensure that operation is within design parameters.

**carbon dioxide**

Colorless, odorless, incombustible gas formed during respiration, combustion, and organic decomposition. Increasing amounts of carbon dioxide in the atmosphere are believed to contribute to the global warming phenomenon.

**CAV**

See *constant volume*.

**CFCs**

See *chlorofluorocarbons*.

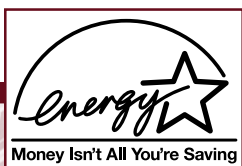
**chiller**

Mechanical device that generates cold liquid, which is circulated through cooling coils to cool the air supplied to a building.

**chlorofluorocarbons**

Chemical compounds consisting of carbon, hydrogen, chlorine, and fluorine, once used widely as aerosol propellants and refrigerants. Believed to cause depletion of the atmospheric ozone layer.





***coefficient of performance (COP)***

A measure of efficiency in which a higher value designates a more efficient system. For example, Chiller efficiency measured in Btu output (cooling) divided by Btu input (electric power), measured at full or part load.

***coil, condenser***

A heat exchanger used to condense refrigerant from a gas to a liquid.

***coil, cooling***

Heat exchanger used to cool air under forced convection, with or without dehumidification. May consist of a single coil section or several coil sections assembled into a bank.

***coil, heating***

Heat exchanger that heats air under forced convection. May consist of a single coil section or several coil sections assembled into a bank.

***condenser***

Heat exchanger used to expel building heat absorbed in the evaporator of a refrigeration system.

***constant volume (CAV, constant air volume).***

Type of air-handling system that supplies the conditioned space at a constant air flow and modulate heating and cooling by varying the air temperature.

***controls***

An instrument or set of instructions for operating or regulating building systems.

***cooling tower***

Device that dissipates heat from water-cooled systems through a combination of heat and mass transfer, whereby the water to be cooled is distributed in the tower and exposed to circulated ambient air.

***COP***

See *coefficient of performance*.

***dampers***

Single- or multiple-blade devices, either manually or automatically opened or closed, that control the flow of air.

***demand charges***

Fees levied by a utility company for electric demand.

***direct expansion system***

Cooling system in which the refrigerant runs in the cooling coil to cool the air directly; that is, there is no water loop between the refrigerant and the air to be cooled.

***downsizing***

Process of reducing the size (capacity) of equipment so that it operates efficiently at design load conditions.

***EER***

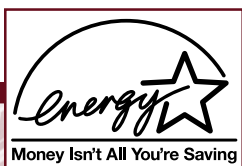
Energy Efficiency Ratio. Cooling capacity (Btu/hr) divided by total input power (watts) requirement.

***efficiency***

Ratio of power output to power input.

***EMS***

See *energy management system*.



**energy management system (EMS)**

The control system that monitors the environment and energy usage in a building and alters equipment operation to conserve energy while providing occupant comfort.

**fan, cooling tower**

Fans that are used to draw air through the cooling tower to carry away water vapor.

**gasket**

Material used to seal a joint against leakage.

**GPM**

Gallons per minute. A measure of water flow rate.

**heat-exchange area**

Area where heat is transferred from one medium to another.

**heat pump**

Heat pump utilize the vapor compression refrigeration cycle the same that a DX unit or chiller does. The difference is that a heat pump can reverse the direction of heat flow which naturally flows from warmer to cooler areas.

**HVAC**

Heating, ventilating, and air-conditioning.

**IEEE**

Institute of Electrical and Electronic Engineers.

**internal rate of return (IRR)**

Compound interest rate at which the total discounted benefits become equal to total discounted costs for a particular investment.

**IRR**

See *internal rate of return*.

**kilowatt (kW)**

Unit of power equal to 1,000 watts.

**kilowatt-hour (kWh)**

Unit of electric consumption equal to the work done by one kilowatt acting for one hour.

**kW**

See *kilowatt*.

**KWh**

See *kilowatt-hour*.

**load, cooling**

Cooling (typically measured in Btu/hr or tons) required to maintain an indoor design temperature.

**part-load conditions**

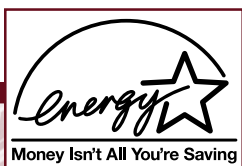
Time when equipment is operating at less than design loads; represents the majority of the time equipment is operating.

**payback**

See *payback, simple*.

**payback, simple**

Also known as *payback*. Measurement of the elapsed time between an initial investment and the point at which accumulated savings are sufficient to offset the initial investment.



**peak (cooling) load**

Maximum cooling required to maintain an indoor design temperature under the most adverse summertime outdoor air conditions.

**pump, chilled-water**

Device that circulates chilled water.

**pump, condenser-water**

Device that circulates condenser water.

**refrigerant**

Substance, such as CFCs, HCFCs, HFCs, air, ammonia, water, or carbon dioxide, used to provide cooling by evaporation and condensation.

**seasonal energy-efficiency ratio (SEER)**

Cooling capacity (Btu/hr) divided by total input power (watts) requirement where both are seasonal averages.

**SEER**

See *seasonal energy-efficiency ratio*.

**setpoint**

Desired temperature, humidity, or pressure in a space, duct, etc.

**space**

The distinct area to which conditioned air is delivered.

**strainer screen**

Filtering device used in water side systems to protect equipment from dirt, rust, and other particles.

**TAB**

See *testing, adjusting, and balancing*.

**ton**

Unit of cooling capacity equal to 12,000 Btu/hr.

**variable air volume (VAV)**

A type of air-handling system that provides air at a constant temperature and varies the air quantity to each zone to match the variation in room load.

**variable-speed drive (VSD)**

A device used to adjust the speed of an AC motor to match load requirements.

**VAV**

See *variable air volume*.

**VSD**

See *variable speed drive*.

**water side systems**

Equipment used to supply heating and cooling for air side systems. Includes pumps, chillers, boilers, and other devices.